

## Cooled, Ultra High Resolution Micro Spectrometer

# ATP5030/4

### Features

- Detector cooling temperature: -5 °C;
- M type optical path, higher resolution;
- Spectral range: 200-1100 nm;
- Spectral resolution: 0.05 ~ 2 nm;
- Optical path structure: non-crossing M-shape C-T
- Detector: 2048 or 4096 pixels;
- Integration time: 0.1ms ~ 256s;
- Power supply: DC 5V power supply;
- ADC bit depth: 16 bits;
- Data output interface: USB Type-C;
- 20-pin expansion interface.

### Applications

- LIBS, Plasma luminescence detection;
- Raman spectroscopy detection;
- Wavelength monitoring, laser, LED and other luminous bodies;
- Water quality analyzer;
- UV flue gas analyzer;
- LED sorting machine, color detection;
- Spectral analysis, radiation spectroscopic analysis, spectrophotometric analysis;
- Reflection and transmission spectrum detection.

### Description

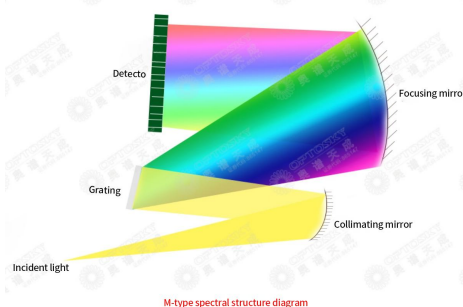
ATP5030/4 is a cooled, ultra-high resolution micro spectrometer newly developed by Optosky, ATP5030/4 is based on the M-type C - T optical path structure independently developed by Optosky, with extraordinary ultra-high resolution; at the same time, it uses a cooled 2048 or 4096 pixel linear array detector to achieve the ultimate ultra-high resolution, the highest resolution can reach 0.05nm, It is a miniature spectrometer suitable for various high-resolution applications, with high reliability, ultra-high speed, low cost, and high cost performance. It can be adapted to various environmental uses such as online testing.

ATP5030/4 adopts TEC electric cooling, the cooling temperature is -5°C. Greatly reduce the dark current and noise of the spectrometer, and improve the dynamic range and signal-to-noise ratio of the spectrometer.

ATP5030 can receive SMA905 optical fiber input light or free space light, and output the measured spectrum data through USB2.0 or UART port.

ATP5030 only needs a 5V DC power supply, which is very easy to integrate and use.

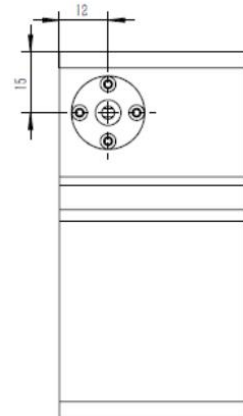
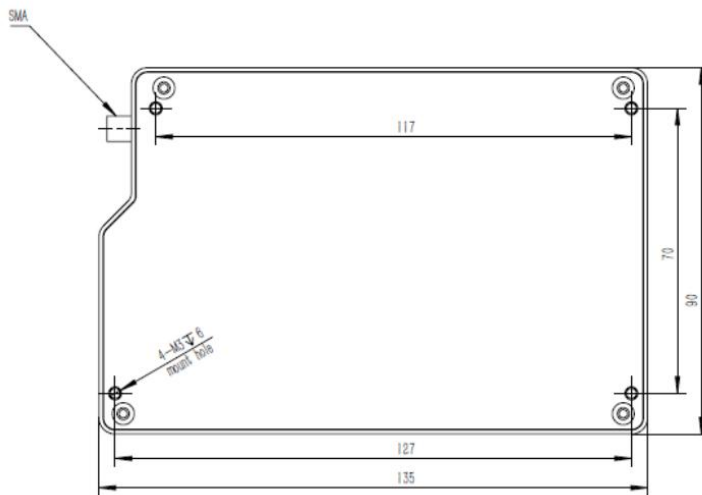
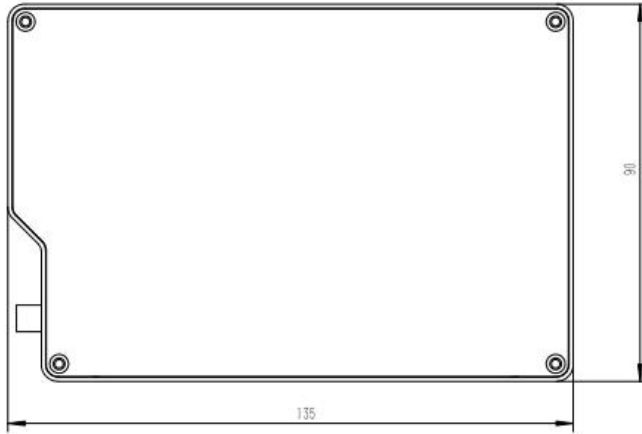
	Detector pixels	
ATP5030	2048	
ATP5034	4096	
ATP5030P	2048	Cooled, Back-thinned CCD

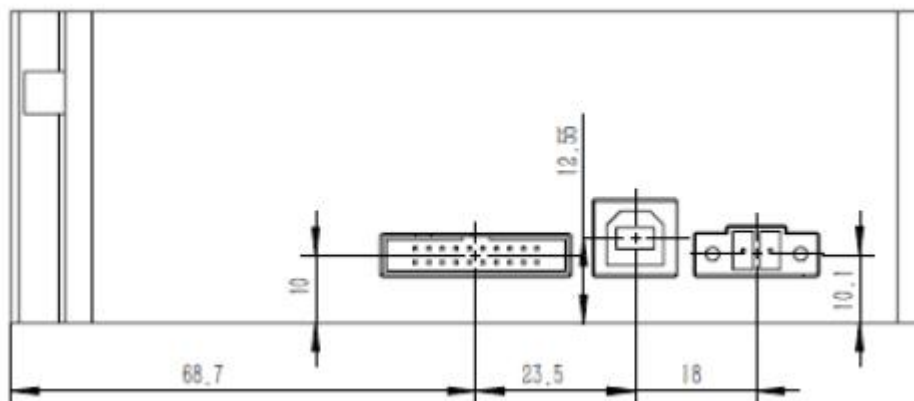


## 1.Parameter

Detector	
Type	Linear array detector
Detectable range	200-1100 nm
Effective pixel	2048 or 4096 pixels
Sensor Cooled	TEC cooled, -5 °C
Pixel dimension	14μm × 200μm
Sensitivity	1300 V/(lx·s)
Dark noise	13 RMS @ 13 °C
Optical Parameter	
Wavelength range	200-1100 nm
Optical resolution	0.07-3 nm
Signal-to-noise	>600:1
Dynamic range	8.5 × 10 <sup>7</sup> (system); 2000:1 for a single acquisition
Stray light	<0.05% at 600 nm; <0.09% at 435 nm
Optical Configuration	
Optical Design	M-type C-T
Focal Distance	75mm
Incidence slit	50 μm (10, 25, 100, 200 μm are optional)
Incident Interface	SMA905 connector
Electrical Parameter	
Integration time	0.1 ms - 256 second
Interfaces	USB Type-C
A/D conversion resolution	16 bit
Supply voltage	DC4.5 to 5.5 V (type @5V)
Operating current	1.5 A@Typ. 3A Max
Storage temperature	-30°C to +70°C
Operating temperature	-25 ~ 50 °C
Working humidity	< 90%RH
Physics Parameter	
Dimension	135 × 99 × 46 mm
weight	0.5 kg
Sealing	Anti-sweat

## 2 Mechanical Diagrams





## 3 Electrical Pin-out

Table 1 Electrical Characteristics

Parameter	Min	Typ	Max	Unit
<b>Power Supply</b>				
Operating voltage range	4.5	5	5.5	V
Operating current		170		mA
<b>Logic Inputs(3.3V LVTTTL, Five-volt tolerant)</b>				
High level input voltage	1.7		3.6	V
Low level input voltage	-0.3		1.0	V
<b>Logic Output(3.3V LVTTTL)</b>				
High level output voltage	2.4			V
Low level output voltage			0.4	V

The module is equipped with a 30-pin male angled box header(2x15, 2.00 mm pitch) and Type-C interface.

Table 2 Electrical Pin-Out

Pin#	Description	I/O	Function Description
1	VCC	/	Power Supply, 5V ± 0.5,
2	GND	/	Ground
3	UART_TX	Output	UART Transmit signal
4	UART_RX	Input	UART Receive signal
5	Lamp_En	Output	LVTTTL output the lamp enable signal.
6	Continuous_strobe	Output	LVTTTL output the continues strobe signal.
7	Ext_trigger_in	Input	LVTTTL input the trigger signal.
8	Single_strobe	Output	LVTTTL output the single strobe signal.
9	SPI_SCK	Output	The SPI Clock signal for communications to other SPI peripherals
10	SPI_MOSI	Output	The SPI Master Out Slave In (MOSI) signal for communications to other SPI peripherals
11	SPI_MISO	Input	The SPI Master In Slave Out (MISO) signal for communications to other SPI peripherals
12	SPI_CS	Output	The SPI Chip/Device Select signal for communications to other SPI peripherals
13	GPIO0	Input /Output	General Purpose Software Programmable Digital Inputs/Outputs, LVTTTL Logic.

14	GPIO1	Input /Output	General Purpose Software Programmable Digital
15	GPIO2	Input /Output	General Purpose Software Programmable Digital
16	GPIO3	Input /Output	General Purpose Software Programmable Digital
17	GPIO4	Input /Output	General Purpose Software Programmable Digital
18	GPIO5	Input /Output	General Purpose Software Programmable Digital
19	GPIO6	Input /Output	General Purpose Software Programmable Digital
20	GPIO7	Input /Output	General Purpose Software Programmable Digital

## 4 Order Guide

Order number Rules:

Model	Spectral region		Slit width	
ATP5030	Short wavelength	Long wavelength	Slit width	

For example:

What to buy ATP5030, spectral region: 200-1000nm, slit width is 50  $\mu\text{m}$ , then the order no is:

**ATP5030-200-1000-050**

Order No	Spectral region	Slit	
ATP5030-200-400-###	200~400	10 $\mu\text{m}$	
ATP5030-200-850-###	200~850	25 $\mu\text{m}$	
ATP5030-200-1000-###	200~1000	50 $\mu\text{m}$	
ATP5030-340-850-###	340~850	100 $\mu\text{m}$	
ATP5030-600-1100-###	600~1100	200 $\mu\text{m}$	
ATP5030-###-###-###	Other	Other: _____ $\mu\text{m}$	

## 5. Company Profile

Optosky company is a first-class spectroscopy solution provider, with the headquarter locates in the 7<sup>th</sup> floor of the research institute of the Chinese Academic of Science at an area of 2500 square meter in Xiamen city where successfully held the international 9<sup>th</sup> BRICK summit in 2017. The subsidiary company locates in Wuhu city with an area of 2035 square meters.

The company founder Dr. Hongfei, Liu graduated Doctor degree from the Chinese Academic of Science and postdoctoral degree from Xiamen University, by integrating both of top Universities' spectroscopy technology background into Optosky company aiming at developing the leading spectroscopy equipment in the world.

The company bases on unique technologies of Optomechatronics, Spectroscopy Analysis, Process Weak Optical and Electrical Signals, Cloud Computing, and have been developed wide products line of the competitive Raman spectroscopy instruments, micro spectrometer, hyperspectral imager, field spectroradiometer, fluorescence spectroscopy, LIBS etc. Driven by advanced technologies and products, Optosky brand has been well-known to customers all over the world.

Optosky company base on technology innovation, market-driven direction, customer first, provides first-class products and services, and one-stop solutions to many fortune 500 companies in many industries. The company received praise from different industry companies, as well as many innovative intellectual properties, software copyright, qualification certification, and winner awards over hundred numbers.

Optosky receives top class A introduced the high-tech company to international Xiamen city, the national high-tech and new innovative technology company award. The founder Dr. Hongfei Liu receives the innovation talent award by the ministry of science and technology.

The company is currently conducting the exclusive project of major industrialization national oceanic administration with a total fund of five million us dollars. The company in charge of drafting national industry standard of VNIR and SWNIR Field Spectroradiometer, and six national standard drafters, including China National Standard Drafter for Hazmat detector based on Raman spectroscopy, China National Standard Drafter for Buoy-type Monitor eco-environment, China National Standard Drafter for water quality monitor in the unmanned boat, China National Standards drafter for online water quality monitor by spectroscopy, China National Standard Drafter for UV-absorbent measure fabrics.

The company has over 70 IPs and over 20 innovative patents.

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The company received ISO9001:2015 certification, CE certification, Police Administration Certification, FDA approval compliant, IQOQPQ compliant.

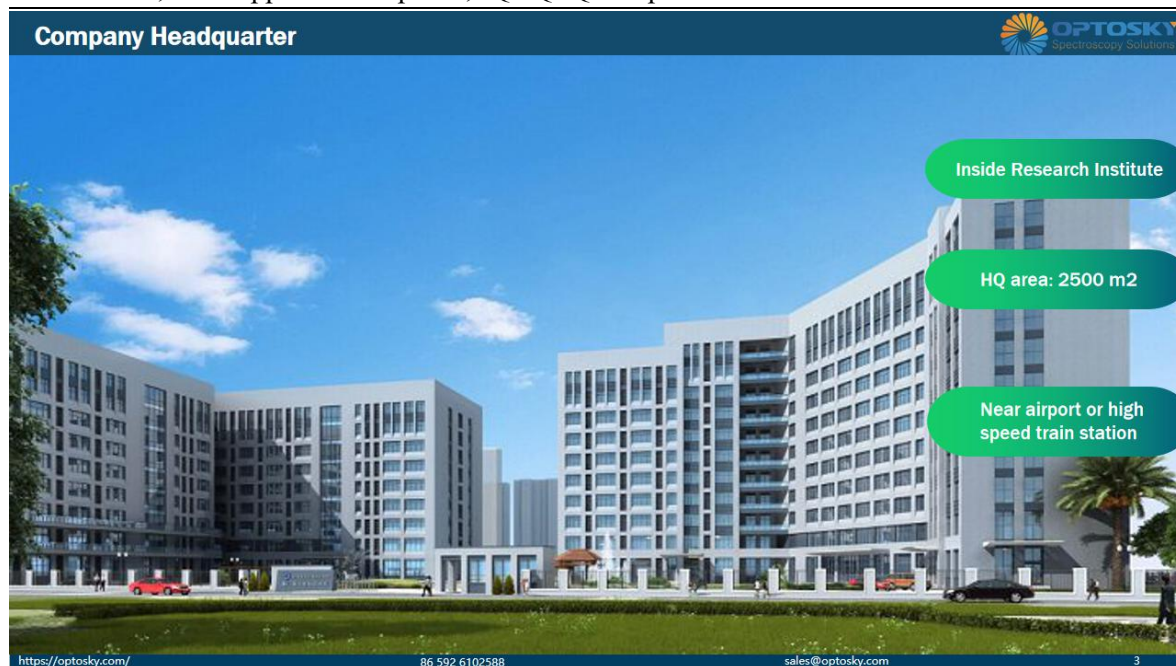


Figure 1 Optosky (Xiamen) Photonics Inc. Company Headquarter

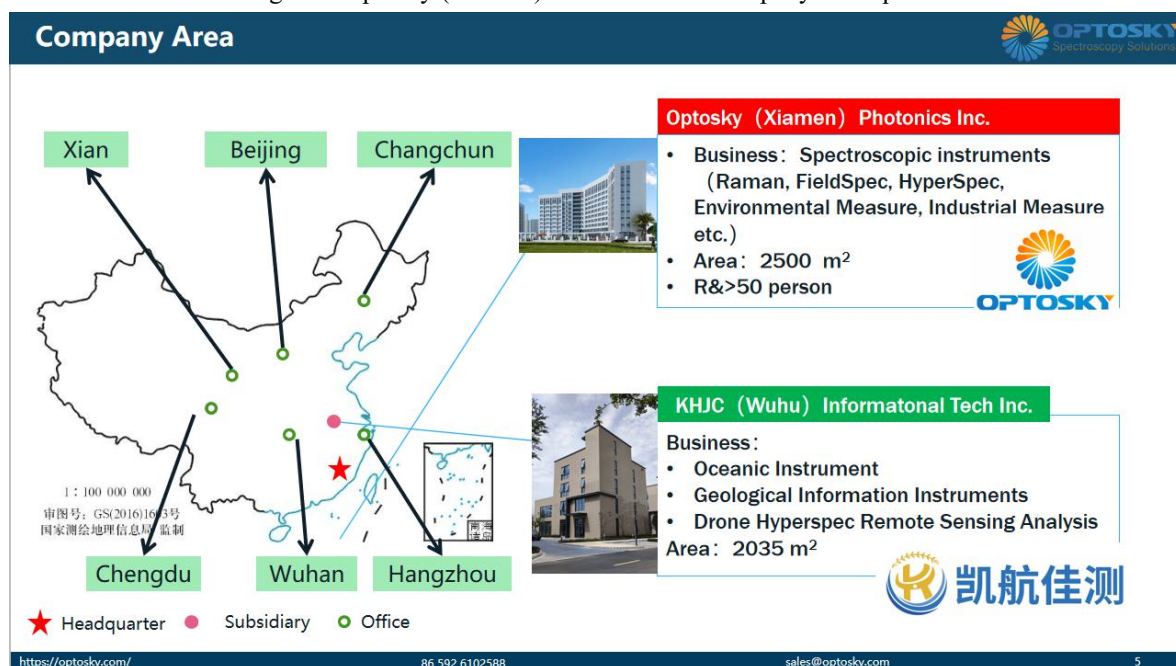


Figure 2 Optosky Company Area



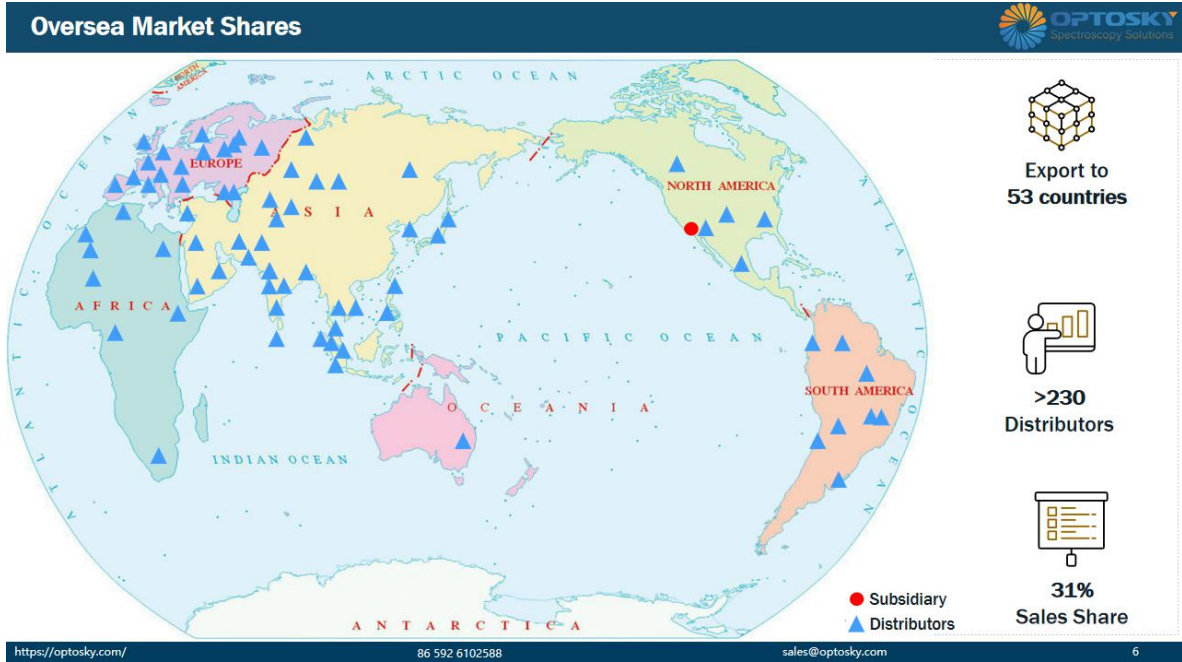


Figure 3 Oversea Market Shares



Figure 4 Optosky Chair and Draft National Standards Lists.

Qualification



 <b>ISO9001:2005</b>	 <b>GB/T 23001</b> Informationization & Innovation	 <b>CE, RoHS, LVD</b> 17 models	 <b>Police Approval</b> 11 models
 <b>GB/T 29490</b> IP implementation	 <b>5 Innovative patents</b>	 <b>35 patents</b> new utility design	 <b>32 Software copyright</b>

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Figure 5 Qualification

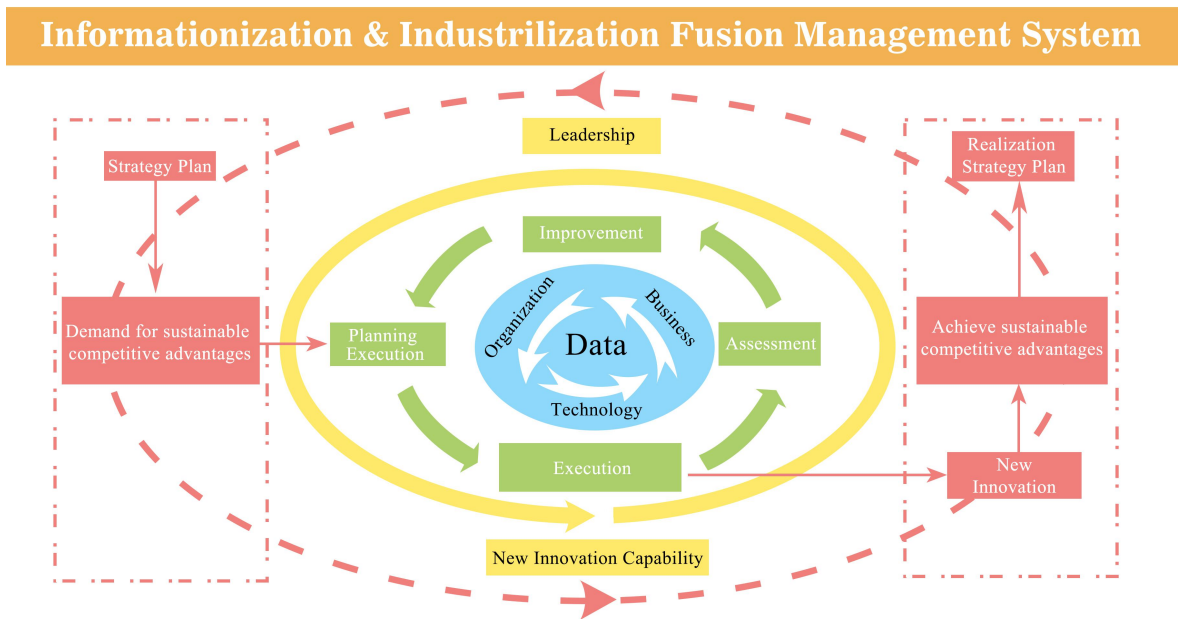


Figure 6 GB/T 23001\_ Informationization & Industrilization Fusion Management System

## Co-Founder—Dr. Hongfei Liu



**Postdoctoral Hongfei Liu**

- Selected "Innovative Talent" by Science and Technology ministry
- Top Class A Talent by Xiamen City
- CCTV Science & Technology Interview
- Fortune 500 experience in Agilent, II-VI

- Honors**
  - Selected by science & technology ministry as "Innovation Talent"
  - CCTV Science & Technology Interview
  - Top Class A Talent credited by Xiamen City
  - Innovation Hero**
- Education**
  - PhD • Chinese Science of Academic • Prof. Gui-Lin Chen, Originator in spectroscopy
  - Postdoctoral • Xiamen University • Prof. Zhong-Qun Tian guided by the SERS founder M.Fleischmann
- Career**
  - Engineer → R&D Manager → GM
  - Agilent**, Leader of instrument, Fortune 500 company, Job: engineer
  - II- VI Incorporated (Nasdaq: IIVI) leader in optical & electrical industries, Job: GM of Instrumentation and Automation
- Academic**
  - University graduate tutor
  - obtain more than 60 IPs, more than 10 Innovation patents;
  - Publish more than 20 papers, 2 recorded SCI, 8 recorded EI



Selected "Innovative Talent" by Science and Technology ministry

Top Class A Talent by Xiamen City

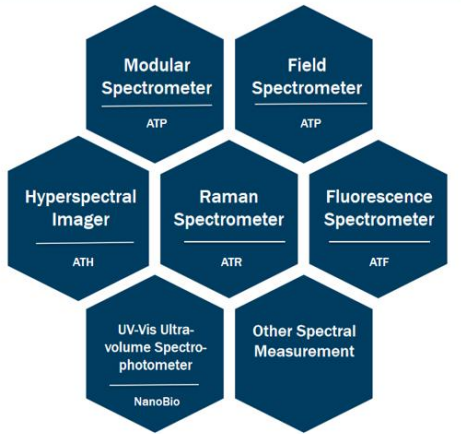
Founder & Tutors

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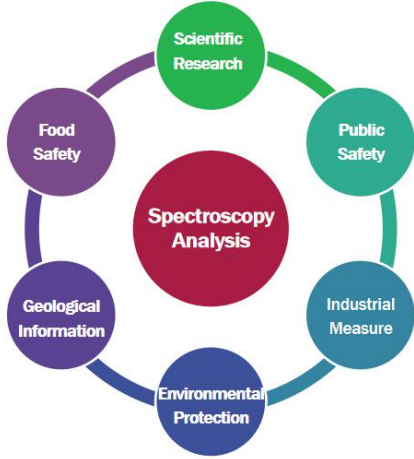
Figure 7 Optosky's Co-founder\_Dr. Hongfei Liu

## Category & Application

### Category




### Application



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Figure 8 Category & Application

**Model Name Rule**


**Model Name Rule:**

- Prefix
- Category
- Model
- Suffix

Prefix

↓

Abbreviation  
OPTOSKY

AT R

↑

Category

3000

↑

Model

- 1064

↑

Suffix

- **ATR** - Raman Spectrometer
- **ATP** - Micro Spectrometer
- **ATH** - Hyperspectral Imager
- **ATF** - Micro Fluorescence Spectrometer
- **ATL** - LIBS
- **ATW** - Water
- **ATE** - Environment Protect
- **ATFD** - Food Safety
- **GA** - Public Safety (**Gong An**)
- **GF** - Gas Monitor (**Gas Finder**)
- **GY** - Industrial Monitor (**Gong Ye**)

eg:

- Raman Microscope: ATR8300MP-1064
- Hyperspectral Imager: ATH9500

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Figure 9 Model Name Rule